The NASA SCI Files™ The Case of the Zany Animal Antics

Segment 4



The tree house detectives dial up Mr. Doug Scheidt, the aquatics program lead at NASA Kennedy Space Center to learn more about endangered animals. Mr. Scheidt explains the levels of endangerment and various factors that can cause a species to become threatened or even extinct. The detectives are curious about when and how animals are rescued. Mr. Scheidt recommends that they visit Dr. Beth Chittick, a veterinarian at SeaWorld® in Orlando, Florida, to learn more about the rescue efforts for injured and sick animals. RJ heads to SeaWorld® and while there he also visits Ms. Virginia (Ginny) Busch, who explains the efforts of the SeaWorld® and Busch Gardens® Conservation Fund and the role it and other partners play in protecting and preserving wildlife. Finally, the detectives visit Mr. Cutchin's backyard, which has been certified as an official backyard habitat. Dr. D meets the detectives at Mr. Cutchin's and they review all they have learned. They believe they are ready to turn Jacob's backyard into the perfect habitat, and they might even be able to help Kali with her final requirement for her Girl Scout wildlife badge.

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Objectives

Students will

- learn about government protections for living things.
- identify causes of endangerment which might lead to extinction.
- · compare levels of endangerment.

- learn about what animals are being rescued and how they are rescued.
- examine ways to conserve backyard habitats.

Vocabulary

Bald Eagle Protection Act—federal protection for bald eagles; through conservation efforts there are now over 7,000 breeding pairs in the U.S.

endangered—in danger of extinction in all or part of its range

exploitation—when a species' population is reduced to a point that it cannot reproduce fast enough to sustain a viable population

manatee—a mammal with no known predators other than human beings; in the 18th and 19th centuries they were hunted for their meat, fat, and hides **special concern**—a species might need protection and conservation; perhaps in the form of periodic monitoring of the populations and the threats to the species and its habitat

threatened—a species is likely to become endangered within the foreseeable future

veterinarian—a doctor for animals

Video Component

Implementation Strategy

The NASA SCI Files™ is designed to enhance and enrich existing curriculum. Two to three days of class time are suggested for each segment to fully use video, resources, activities, and web site.

Before Viewing

- 1. Prior to viewing Segment 4 of *The Case of the Zany Animal Antics*, discuss the previous segment to review the problem and what the tree house detectives have learned thus far. Download a copy of the **Problem Board** from the NASA SCI Files™ web site, select **Educators**, and click on the **Tools** section. The **Problem Board** can also be found in the **Problem-Solving Tools** section of the latest online investigation. Have students use it to sort the information learned so far.
- Review the list of questions and issues that the students created prior to viewing Segment 3 and determine which, if any, were answered in the video or in the students' own research.
- Revise and correct any misconceptions that may have been dispelled during Segment 3. Use tools located on the Web, as was previously mentioned in Segment 1.
- 4. Review the list of ideas and additional questions that were created after viewing Segment 3.
- 5. Read the overview for Segment 4 and have students add any questions to their lists that will help them better understand the problem.

6. Focus Questions—Print the questions from the web site ahead of time for students to copy into their science journals. Encourage students to take notes during the program to answer the questions. An icon will appear when the answer is near.

View Segment 4 of the Video

For optimal educational benefit, view *The Case of the Zany Animal Antics* in 15-minute segments and not in its entirety. If you are viewing a taped copy of the program, you may want to stop the video when the Focus Question icon appears to allow students time to answer the question.

After Viewing

- 1. At the end of Segment 4, lead students in a discussion of the Focus Questions for Segment 4.
- Have students discuss and reflect upon the process that the tree house detectives used to learn more about the future of space exploration. The following instructional tools located in the Educators area of the web site may aid in the discussion: Experimental Inquiry Process Flowchart and/or Scientific Method Flowchart.
- 3. Choose activities from the **Educator Guide** and web site to reinforce concepts discussed in the segment. Pinpoint areas in your curriculum that may need to be reinforced and use activities to aid student understanding in those areas.



- 4. For related activities from previous programs, download the Educator Guide. On the NASA SCI Files™ home page, select Educators. Click on Episodes in the menu bar at the top. Scroll down to the 2003–2004 Season and click on The Case of the Prize Winning Plants. In the green box, click on Download the Educator Guide.
- a. In the Educator Guide you will find
 - a. Segment 1 Danger! Deforestation
 - b. **Segment 2** Adapting for the Future
 - c. **Segment 4** Too Much of a Good Thing

Close the PDF window and return to the Educator Guide page. Click on **Episodes** in the menu bar at the top. Scroll down to the 2003–2004 Season and click on *The Case of the Inhabitable Habitat*. In the green box, click on **Download the Educator Guide**.

- b. In the Educator Guide you will find
 - a. Segment 4 Bloomin' Algae

5. Wrap up the featured online PBL investigation. Evaluate the students' or teams' final product, generated to represent the online PBL investigation. Sample evaluation tools can be found in the **Educators** area of the web site under the main menu topic

Careers

research biologist field biologist veterinarian technician laboratory manager medical technologist

Tools by clicking on **Instructional Tools**.

6. Have students write in their journals what they have learned about animals, classification, populations, habitats, food chains and webs, endangered animals, and animal rescue and conservation so that they can share their entry with a partner or the class.

Resources (additional resources located on web site)

Books

Anderson, Laurie Halse: *Manatee Blues, Vol. 4.* Pleasant Company Publications, 2000, ISBN: 1584850493.

Berger, Melvin and Gilda Berger: Where Have All the Panda Gone? Scholastic, Inc., 2002, ISBN: 0439266696.

Charman, Andrew: *I Wonder Why the Dodo is Dead and Other Questions about Extinction*. Houghton Mifflin, 1996, ISBN: 0753450143.

George, Jean Craighead: *The Case of the Missing Cutthroats: An Ecological Mystery.* HarperCollins Publishers, 1999, ISBN: 0064406474.

Jackson, Donna: *The Wildlife Detectives: How Forensic Scientists Fight Crimes Against Nature*. Houghton Mifflin, 2002. ISBN: 0618196838.

Jacobs, Francine: *Lonesome George, the Giant Tortoise*. Walker and Company, 2003, ISBN: 0802788645.

London, Jonathan: *Condor's Egg.* Chronicle Books, 1999, ISBN: 0811823121.

Miller, Louise: *Careers for Animal Lovers and Other Zoological Types*. McGraw-Hill, 2000, ISBN: 0658004638.

Swinburne, Stephen: *Once a Wolf: How Wildlife Biologists Fought To Bring Back the Gray Wolf.* Houghton Mifflin, 2001, ISBN: 0618111204.

Williams, Judith: Saving Endangered Animals with a Scientist. Enslow Publishers, 2004, ISBN: 0766022765.

Wright, Alexandra: *Will We Miss Them?* Charlesbridge Publishing, 1993, ISBN: 0881064882.

Video

Schlessinger Media: Animal Life in Action: Endangered and Extinct Animals
Grades 5–8

Schlessinger Media: *People Who Love Working with Animals*Grades K–6

Web Sites

SeaWorld® and Busch Gardens® Conservation Fund

Visit this site to learn more about the fund and its projects around the world.

http://www.swbq-conservationfund.org/

SeaWorld®

This web site contains information for kids, parents, and teachers about animals. Learn how SeaWorld® and Busch Gardens® are working to protect endangered animals. Visit the Fun Zone for coloring books, songs, Shamu TV, and much more. There are also great resources available for teachers.

http://www.seaworld.org/

Discovery School Animal Cams

On the Discovery School web site you can view live images with animal cams. http://school.discovery.com/schooladventures/animalcams/index.html

Kids' Planet

Kids' Planet is an interactive web site for kids to learn about animals. The web site has games, printable coloring pages, stories, cool facts, and much more. http://www.kidsplanet.org



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BBC - Science and Nature - Children's Zone

Learn about animals, view video clips, take fun quizzes, listen to animal sounds, and play online games on the BBC's Children's Zone web site.

http://www.bbc.co.uk/nature/reallywild/

Operation Wildlife

This informative web site gives valuable information on what to do if you find an injured wild animal. http://www.owl-online.org/content/library/field.htm

ASPCA's Animal Land

Visit the ASPCA's web site to learn about animals, play games, view cartoons, and learn how to take care of pets. http://www.animaland.org/

Wildlife Conservation Society Kids Go Wild

This web site contains information about animals and conservation, education, and management efforts towards animals.

http://wcs.org/7490/kidsgowild

Kids Go Wild—Wildlife Conservation Society

Find out about wild animal news across the globe, learn fun wild animal facts, and play wild animal games in the arcade.http://www.kidsgowild.com/

World Wildlife Fund

WWF directs its conservation efforts toward three global goals: saving endangered species, protecting endangered habitats, and addressing global threats such as toxic pollution, over-fishing, and climate change. From working to save the giant panda and bringing back the Asian rhino to establishing and helping manage parks and reserves worldwide, WWF has been a conservation leader for more than 40 years.

http://www.worldwildlife.org/index.cfm

Wildlife Conservation Network

Wildlife Conservation Network is dedicated to the support of conservation entrepreneurs who are working actively with local communities to protect endangered flagship species and preserve their natural habitats. http://www.wildnet.org/index.htm

International Wolf Center

The International Wolf Center advances the survival of the wolf populations by teaching about wolves, their relationship to wild lands, and the human role in their future. Wolves, once on the nearly extinct list, have recovered to levels that might lead to their removal from the endangered list.

http://www.wolf.org/wolves/index.asp

Bat Conservation International

BCI's mission is to teach people the value of bats, to protect and save critical bat habitats, and to advance scientific knowledge through research. http://www.batcon.org/

Endangered Species

Visit EndangeredSpecies.com and click on your area on the United States map to find out the endangered and threatened animals in your area. http://www.endangeredspecie.com/map.htm

U.S. Fish & Wildlife Service – Endangered Species Program

Visit this U.S. Fish & Wildlife Service's web site to find a list of threatened and endangered wildlife, species information, conservation practices currently in place, and the laws and policies in place to protect wildlife. http://endangered.fws.gov/

American Museum of Natural History

Located in New York, the American Museum of Natural History contains a large volume of information on endangered species and habitats, the causes of endangerment, and possible solutions to the problem. http://www.amnh.org/nationalcenter/Endangered/

Endangered Species of the Next Millennium

Learn about endangered species on this web site. The site explains what animals are endangered, why they are endangered, and how they became endangered. http://library.thinkquest.org/25014/english.index.shtml

EndangeredSpecie.com

Visit this web site to learn more about endangered species, including causes of endangerment, ways you can help, laws that protect, and many other valuable resources related to endangered species.

http://www.endangeredspecie.com/

Activities and Worksheets

In the Guide Saving Rald Fagle

	Zany Animal Words
	Points of View Look at issues from more than one point of view
	Cape of Good Hope Visualize how many endangered cats would be needed to create a fur cape
	Postcards That Protect Identify and complete research about living things that are threatened, endangered, or categorized as of special concern
iii tile dulue	Interpret and make inferences about bald eagle populations

Answer Key

On the Web Going Wild in the Backyard

Learn more about Backyard Wildlife Habitats™

Saving Bald Eagle

Purpose

To interpret and make inferences about bald eagle populations

Background

The Bald Eagle Protection Act was passed in 1940. This law prohibited collecting or harming bald eagles, their nests, and their eggs. Since then, this act has been amended several times, reflecting an increased public awareness of the plight of the bald eagle. In fact, in 1995, the U.S. Fish and Wildlife Service reclassified the bald eagle from endangered to threatened in all of the lower 48 states.

Segment 4

Materials

graph paper calculator

Procedure

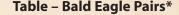
- 1. Carefully read and analyze the data in the table, Bald Eagle Pairs.
- 2. Graph this information as a line graph to show change over time.
- 3. Be sure you label each axis of your graph and give your graph a title. "Time" should go on your "x-axis" and "Number of bald eagle pairs" should be represented by your "y-axis."

Conclusion

- 1. What pattern or trends do you see in the number of bald eagle pairs?
- 2. Using the data in the table, determine the data range. Remember, the range is the difference between the largest number and the smallest number in a set of data.

Extension

1. DDT, an insecticide that was used along coastal and other wetland areas, was banned on December 31, 1972 in the U.S. DDT built up in the fatty tissue of adult female bald eagles. These female birds produced eggs with very thin shells. The shells broke when the female birds sat on the nests. What relationship do you see between the data and the banning of DDT?





Year	Number of Bald Eagles
1963	417
1974	791
1981	1,188
1984	1,757
1986	1,875
1988	2,475
1989	2,680
1990	3,020
1991	3,391
1992	3,747
1993	4,016
1995	4,452

Postcards That Protect

Purpose

To identify and research living things that are threatened, endangered, or categorized as of special concern

Background

Some plants and animals need protection or they may become extinct. When a living thing can no longer be found on Earth, it is "extinct." Some living things are nearly extinct, or endangered. Threatened living things are likely to become endangered if they are not protected. Living things that might need some form of protection may be identified as a special concern. Officials keep an eye on living things of special concern, alert to changes in their populations and habitats.

Segment 4

Materials (per student)

10-cm x 15-cm cardboard or poster board rectangular cutouts art materials—crayons, colored pencils, magic

markers research materials

Procedure

- Find out more about endangered and threatened species.
 One place to begin your research is at the U.S. Fish and Wildlife Services Web site: http://endangered.fws.gov/ wildlife.html#Species
- 2. Choose one species and do more research.
- 3. Decorate the front of the rectangular card with drawings of your species.
- 4. Send the card to a friend or family member. On the message side, tell the person why this living creature should be protected.

Conclusion

- 1. What endangered or threatened living things can be found in your area?
- 2. What can you do to help protect these living things?

Extension

- 1. As a fund-raiser, make copies of some of the postcards. Give all proceeds to a wildlife conservation program.
- 2. Create an endangered species calendar.





Cape of Good Hope*

Purpose:

To visualize how many endangered cats would be needed to create a fur cape

Teacher Prep

- 1. Prior to the activity, enlarge the ocelot pelt pattern to a scale of 1:5. If you create the pattern by using an overhead transparency, project the pelt so that it is 117.5 cm from the tip of the ocelot's nose to the tip of its tail.
- 2. Divide the class into groups of three to five students.

Background

In the past, unregulated hunting has caused near extinction for many fur-bearing animals. Some smaller cats, such as the ocelot or margay, have been used for "elegant" coats and luxury items. These cats have thick, tawny brown coats that are often spotted black and striped for camouflage in rain forest regions.

Procedure

- 1. In your group, create a fashion design team. You are going to design and create a cape or coat from the large, plastic garbage bag.
- 2. Create the cape or coat by using the garbage bag as fabric.
- 3. Few people really want to wear garbage bag coats. But some DO want to wear fur coats. You're going to see how many pelts it would take to cover your garbage bag coat and turn it into a fur coat.
- Look at the ocelot pelt pattern. The Fish and Game Department drew this pattern from an actual, confiscated ocelot pelt.
 - a. The area to the right of the dashed line indicates the underbelly fur, which is a lighter color and has a different nap from the upper fur. Because of this difference, the under part of the fur is not used in the fashioning of the capes; instead, it is wasted.
 - b. The animal's limbs and head are also not used.
 - c. Look at the darkened areas in the head. Those closest to the nose are the eyeholes and those farther in
 - d. The outlined places in the shoulder indicate areas where the fur is flawed. These flawed areas, head, limbs, and tail are not used for creating the coats.
- 5. Cut off all the unuseable parts.
- 6. Use the new ocelot pattern to cut as many "usable" pelt pieces out of newspaper as needed to cover your plastic bag coat.
- 7. Tape the pieces on to cover the entire coat.
- 8. Have a fashion show.

* This activity is modified and used with the permission of the AIMS Education Foundation, http://AIMSedu.org

Segment 4

Materials

large, plastic garbage bag newspaper pelt pattern scissors transparent tape ocelot pelt pattern (p. 82)



Cape of Good Hope*

Segment 4

Conclusion

- 1. How many pelts did it take to make your cape?
- 2. Why is such a small part of the cat's pelt used to make the coat? Why isn't more used?
- 3. On a striped coat, would it be important for all the stripes to line up? How about a spotted one? How would the lining up of stripes affect the number of pelts it would take to complete one coat?

Extension

- 1. Draw stripes on your newspaper pelts and try to line them up on your coat. How would doing so affect the number of pelts needed for the coat?
- 2. Do more research on endangered cats and what is being done to protect them.
- 3. Visit a zoo to observe cats and other endangered animals.



Ocelot



Cape of Good Hope* Ocelot Pattern ABCDEFGHIJKLMNOPQ Ocelot Pelt Pattern Scale 1:5



FEBRUARY 1995

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Points of View

Purpose

To look at issues from more than one point of view

Teacher Note: You may want to use these situations for role-play. Encourage your students to think about the issues from different perspectives. They may want to dress up to help act out the parts.

Segment 4

Materials

What are you thinking? (p. 84–85)

Background

People often have very different ideas and opinions. They base these opinions upon their background, family interactions, needs, and values.

When people have opposing opinions, it's often difficult to make decisions. It may become a judgmental time, when something is deemed right or wrong, good or bad. Using the following steps to help solve a problem can move people from judging an issue to evaluating an issue.

You might try to

- understand the situation and get as much information as possible.
- · check your feelings.
- · consider any information you may have on the needs or intentions of the other people involved.
- · write down conflicts.
- · brainstorm for alternatives.
- · evaluate each alternative.
- decide which alternative is best for most.
- explain your choice to others.
- · take action.

Procedure

- 1. Read through the situations listed on the "What are you thinking?" sheet.
- 2. Choose one point of view. You'll discuss this topic from that perspective.
- 3. Discuss the issue with your friends, carefully listening to their ideas and opinions.
- 4. Take a vote at the end of the discussion to see how many people agree with one side or the other.

Conclusion

- 1. What is the difference between a fact, an opinion, and an inference?
- 2. What were the main facts you used to support your opinions?
- 3. Did your discussion use more facts than opinions?
- 4. Which helped persuade the others—facts or opinions?
- 5. What can you do to change the problem?

Extension

- 1. Create your own scenarios by writing your own environmental issues, situations, and points of view.
- 2. Survey other groups in your school or at home to find out their opinions on the issues. Create posters or flyers to raise awareness about an important issue.



Points of View

What are you thinking?

What are you thinking? —Worksheet

Environmental Issue 1: Animal habitats are being destroyed, causing many animals to become endangered.

Situation: A young bat, taken in by a family when it was sick, has been raised to maturity and can no longer live in the family's small apartment.

Points of View

Son or daughter—has been very involved in taking care of the bat; loves it very much; wants it to have a good home

Father or Mother—bat was more expensive to care for than the family expected; believes the bat has become dependent upon the family and will not survive in the wild; thinks the bat should be given to the zoo

Fish and Wildlife Representative —concerned because the bat is an endangered animal; even though it's thoughtful that the family has taken care of the bat, they shouldn't have kept it and should have contacted official wildlife rescue teams to take care of it

Environmental Issue 2: Trees are being cut down and animal habitats are being destroyed

Situation: A farmer and his/her son or daughter are looking at clearing a piece of land for farming.

Points of View

Farmer—farming has been in the family for years; it's a hard life, but one they love; plans to plant crops to help support family

Son or Daughter—just studied about the greenhouse effect and is concerned about the environment; believes people should stand up for what they believe; wants an expensive CD player and new sneakers for next birthday

Naturalist—very outspoken about the need to protect the land; the land has some rare species of birds living there; very few natural habitats like this one around; represents the government to set this land aside as protected

Environmental Issue 3: The climate seems to be warming and the air is becoming more polluted.

Situation: City council is meeting to discuss closing the downtown streets to personal cars.

Points of View

City Council Member—downtown streets are congested; there would be less traffic if only mass transit were allowed downtown; wants to be re-elected

Citizen 1—needs to get downtown to work but lives outside the city; works late at night and doesn't feel safe walking the streets late at night

Citizen 2—doesn't think cars are the problem but points to factory pollution; angry about increases in bus costs; thinks personal cars can go downtown but only if they have three or more people in the car



Points of View

What are you thinking?

Environmental Issue 4: Land is scarce and must be protected.

Situation: City council meeting to discuss how a piece of land will be used.

Points of View

City Council Member—tired and overworked; wants to be fair, but wants to be re-elected; has small children waiting at home; worries about balancing the city's budget

Racing Car Owner—racing club made large donation to city last year; wants to use land to build a raceway

Naturalist—land is forested and has several plants and animals that can't be found anywhere else in the city; wants a park built

Hunter—wants to maintain the area as natural but wants to allow fishing and hunting; close to the center of town, but not too close for safety issues

Real Estate Developer—wants to build a housing development on the land and bring in more people to increase employment opportunities

Environmental Issue 5: Our air, water, and land are all being polluted.

Situation: Chemicals have been found in the local water source.

Points of View

Proud Owner—lived in neighborhood for year; has a beautiful lawn and flower bed; has back problems so cannot weed yard; uses weed killer because it's easy and cheap

Neighbor—proud of the neighborhood but concerned about the children inhaling chemical fumes; weeds own lawn

President of local company—local company pumps fumes into the environment, just below the legal levels; adding equipment to reduce pollution would be expensive; employs many people who live in the neighborhood

Employee of the company—has three children and a dog to support; can't afford to lose the job; one of the children has asthma

Government Representative —warns that stronger regulations may be applied to the company



Zany Animal Words

Segment 4

Find the words in the word bank.

omnivore consumers habitat bald eagles ectotherm carnivore food chain territorial exploitation endotherm herbivore migration population vertebrate classification

producers reproduction endangered invertebrate species

D S

Happy Habitat

Segment 4

Create a crossword puzzle with the following terms and the grid below.

omnivore producers migration ectotherm invertebrates carnivore consumers habitat endotherm

population

herbivore food chain endangered vertebrate

Across Down 1. 1. 2. 2. 3. 3. 4. 4. 5. 5. 6. 6. 7. 7. 8. 8. 9. 9. 10. 10.

Answer Key

Saving Bald Eagle

- 1. Answers will vary, but students should note a steady increase in the number of breeding pairs.
- 2. The range is 4035.

Postcards That Protect

- 1. Answers will vary.
- 2. Answers will vary.

Cape of Good Hope

- 1. Answers will vary.
- Only the central portion of the cat's back, without leg fur and without light colored belly fur, is used.
- Each cat's strip or spot pattern and coat color is slightly different; therefore, completing a coat may involve considerable waste. It would take a lot of pelts to complete such a coat.

Points of View

- 1. A fact is something that can be proven and has actual existence. An opinion is someone's view or judgment. An inference is a statement based upon information or other statements believed to be true.
- 2. Answers will vary.
- 3. Answers will vary.
- 4. Answers will vary.
- 5. Answers will vary.

Backyard Wildlife Habitats™

- 1. Encourage your family to use little or no chemicals on their yard, to plant only native plants, and to learn more about the living things in your backyard.
- 2. If we harm the environment today, we will be eliminating habitats for others.

Segment 4

Zany Animal Words

BCONSUMERSYN NMOMGTATIBAH S GEN Ε 0 S C R 0 U Н Р T Ε 0 0 RP D Ε Ε ROV VERTEBRATE GAEMETARBETREVNI HERBIVORE CSNIKKINYN MFAEBZXRYNOITARGIMSE

